

REMARKS

Reconsideration and allowance of the subject application are respectfully requested. By this Amendment, Applicant has canceled claim 26 and added new claims 43-48. Thus, after entry of the foregoing amendments, claims 1-25 and 27-48 are pending in this application with claims 37-42 withdrawn from consideration as being directed to a non-elected invention. Applicant respectfully submits that the pending claims define patentable subject matter.

As a preliminary matter, Applicant thanks the Examiner for indicating that claims 8-11, 19, 25 and 28-30 would be allowed if rewritten in independent form 11-13. However, Applicant respectfully requests the Examiner to hold in abeyance the rewriting of these claims until the Examiner has had the opportunity to reconsider the rejected parent claims in light of the arguments presented below in support of the Applicant's traverse of the rejections.

Claims 13, 14 and 16 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because the Examiner maintains that the language defining the bead portion in claim 13 is unclear. By this Amendment, Applicant has amended claim 13 to improve clarity by changing "bead portion" in the last line to "bead core". See paragraph 0044 on page 22 of the specification for support. In view of this amendment, the Examiner is requested to withdraw the § 112, second paragraph, rejection.

Claims 1, 2, 12, 22, 26, 27, 32, 32 and 34 are rejected under 35 U.S.C. §102(b) as being anticipated by Sakaki (JP 03262712; hereafter "JP '712"). Claims 1-7, 12-18, 20, 22, 26, 27, 31, 32 and 34 are rejected under 35 U.S.C. §102(b) as being anticipated by Monzini (USP

4,168,732). Claims 1-7, 12, 27, 31 and 34 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kobayashi (JP 50-71004; hereafter "JP '004") in view of Mechanics of Pneumatic Tires (pages 360-363 and 372). Claims 1-7, 12-18, 20, 22, 26, 27, 31, 32 and 34 are rejected under 35 U.S.C. §103(a) as being unpatentable over Monzini in view of Mechanics of Pneumatic Tires. Claims 21, 23, 33 and 35 are rejected under 35 U.S.C. §103(a) as being unpatentable over either one of (a) JP '712, (b) Monzini and Mechanics of Pneumatic Tires, or (c) JP '004 and Mechanics of Pneumatic Tires as applied against claims 12 and 31, respectively, and further in view of Yamada (USP 5,423,366). Claims 24 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over either one of (a) JP '712 and Yamada, (b) Monzini, Mechanics of Pneumatic Tires, and Yamada or (c) JP '004, Mechanics of Pneumatic Tires and Yamada as applied against claims 21 and 33, respectively, and further in view of Unseld (USP 5,665,298).

In summary, the Examiner takes the position that independent claims 1 and 27 are anticipated by JP '712 and Monzini, and rendered obvious by JP '004 in view of Mechanics of Pneumatic Tires. In support of the rejections of independent claims 1 and 27, the Examiner cites Fig. 1 of JP '712 and Fig. 1 of Monzini for allegedly disclosing every feature recited in claim 1 and claim 27. Regarding JP '004, the Examiner cites Fig. 4 as meeting the width requirement in claims 1 and 27. Although the Examiner acknowledges that JP '004 does not expressly disclose the carcass ply and belt layer, the Examiner asserts that this is old and well known, as allegedly evidenced by the Mechanics of Pneumatic Tires publication.

By this Amendment, Applicant has amended independent claims 1 and 27 to incorporate the subject matter of dependent claim 26. In particular, claims 1 and 27 now recite “said carcass ply comprises two neighboring portions which are adjacent to said end portions of said carcass ply and are not held in said rim, and said neighboring portions have an outer surface whose center of curvature, viewed in a cross section including said center axis of said tire, is located outside of said carcass ply with respect to the center axis of said tire.”

For example, as shown in Figure 4 of the present application, a carcass ply 2 has a neighboring portion 2d adjacent to an end portion 2a held in a rim 10. The neighboring portion 2d is not held in the rim 10 (see the specification at paragraph (0015)). The neighboring portion 2d has an outer surface 32 whose center of curvature “O”, viewed in a cross-section perpendicular to the circumference of a tire, is located outside (A1 side) of the carcass ply 2 with respect to the center axis “D” of a tire. The cross-section includes the center axis of the tire.

As shown in Fig. 5 of the present application, when a stress is applied on the tire (arrow “X”), the outer surface of the carcass ply 2 is pushed toward the center axis “D” (see specification at paragraph (0021)). Fig. 5 shows the approximate shapes of a carcass ply 2 before applying the stress (represented by a solid line) and deformed carcass ply 2 after applying the stress (represented by broken lines). The neighboring portion 2d adjacent to the end portions 2a is considerably bent/deformed inwardly as indicated by arrows “N”.

The neighboring portion 2d can be easily bent with the point “P” as its fulcrum (see Fig. 4), when a stress is applied on the outer surface of the carcass ply 2 as an arrow “X”. Such considerable deformation of the neighboring portion 2d absorbs the stress applied on the tire to

reduce the deformation of the other parts of the carcass ply 2. As a result, it is possible to preserve the roundness of the belt layer 8 as a whole. Further, as shown in Fig. 6 and discussed in the specification at paragraph (0022), a rolling resistance can be reduced by preserving the roundness of a tire when the tire is rolling.

With regard to the subject matter of claim 26 which has been incorporated into claims 1 and 27, the Examiner asserts that “the carcass ply of Sakaki is defined by an end portion that is held within/against the rim and a neighboring portion that is not held within/against the rim.” Similarly, the Examiner contends that “the carcass ply of Monzini is defined by an end portion that is held within the rim and a neighboring portion that is not held within the rim.”

Applicant respectfully submits that neither Sakaki nor Monzini teaches or suggests “said carcass ply comprises two neighboring portions which are adjacent to said end portions of said carcass ply and are not held in said rim, and said neighboring portions have an outer surface whose center of curvature, viewed in a cross section including said center axis of said tire, is located outside of said carcass ply with respect to the center axis of said tire”, as claimed.

As shown in Figs. 1 and 2 of Sakaki, a carcass 16 has a toroidal shape. A neighboring portion adjacent to an end portion of the carcass thus has a toroidal shape, that is, a shape of an arc. The outer surface of the neighboring portion thus has a center of curvature inside of the carcass ply, with respect to the center axis of a tire 11. Accordingly, the neighboring portion is bent outwardly, when a stress is applied on the outer surface of the carcass 16.

Monzini teaches that the deflection in side walls of a tire is restrained to obtain an appreciable difference between the unloaded side wall radius (r) and loaded radius (r') of the side wall portion which is free to deflect (see col. 4, lines 56-61). As shown in Figs. 1-4, a neighboring portion adjacent to an end portion of a carcass has a center of curvature inside of the carcass, with respect to the center axis of a tire.

According to col. 5, lines 24-28 of Monzini, the deflection under load of the tire portion in a direction outwardly of the contour 62 of restrainer 54, results in an essentially flexural deformation of side portions having a small radius (r'). According to Monzini, the outer surface of the neighboring portion thus has a center of curvature inside of the carcass ply, with respect to the center axis of a tire. The neighboring portion is bent outwardly, when a stress is applied on the outer surface of the carcass ply.

Similarly, Applicant respectfully submits that the other cited references do not make up for the above noted deficiencies of Sakaki and Monzini.

Accordingly, Applicant respectfully submits that amended independent claims 1 and 27, as well as dependent claims 2-7, 9, 12-18, 20, 21-24 and 31-36, should be allowable because the combined references do not teach or suggest all of the features of the claimed invention.

By this Amendment, Applicant has added new dependent claims 43-48 in order to further define the claimed invention.

With regard to new claims 43 and 46, Applicant respectfully submits that the cited references do not teach or suggest “wherein a starting angle θ is less than or equal to 45° ,

wherein said starting angle θ is defined as an angle between the inner surface of said carcass ply and the direction of tire thickness "B", measured at a point "P" where the carcass ply and rim meet each other." According to Sakaki, a starting angle θ , defined as an angle between the inner surface of the carcass ply 16 and the direction of tire thickness, measured at a point where the carcass ply 16 and rim 22 meet each other, is near 90° . Further, Monzini does not specifically disclose the starting angle θ of 45° or lower.

With regard to new claims 44 and 47, Applicant respectfully submits that the cited references do not teach or suggest "said outer surface has a radius of curvature "r" which is less than or equal to 50 mm." In particular, neither Sakaki nor Monzini describe the radius of curvature of the outer surface of the neighboring portion.

With regard to new claims 45 and 48, Applicant respectfully submits that the cited references do not teach or suggest "said neighboring portion is deformed inwardly when a stress is applied on said tire toward said center axis of said tire." In particular, both Sakaki and Monzini disclose the neighboring portion is deformed outwardly when a stress is applied on the tire toward the center axis of said tire.

In view of the preceding amendments and remarks, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue that the Examiner feels may be best resolved through a personal or telephonic interview, he is kindly requested to contact the undersigned attorney at the local telephone number listed below.

AMENDMENT UNDER 37 C.F.R. §1.111
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A Petition for Extension of Time and an Excess Claim Fee Payment Letter with appropriate fees accompany this document. The USPTO is directed and authorized to charge all additional required fees (except the Issue Fee and/or the Publication Fee) to our Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

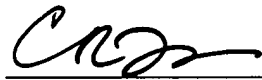
Respectfully submitted,

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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CUSTOMER NUMBER

 **CHRISTOPHER LIPP**
Reg No 41,157
for Steven M. Gruskin
Registration No. 36,818

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